TABLE XVII

CATHODE: $ZnFe_2O_4$/Pt

ANODE: Pt

Per Example C-9

Ex.	Temp.C	I.mA	App.,V	Feed	ppmSO_2 Effluent	% SO_2 Reduced
E-10:						
10-1	700	40	0	A	7650	17.7
10-2	700	50	0.1	A	6350	31.7
10-3	700	65	0.2	A	5147	44.7
10-4	700	80	0.3	A	3497	62.4
10-5	700	100	0.3	B	229	97.5
C/7	700	OPEN	OPEN	B	12,587	*
10-6	700	100	0.3	B	366	96.0
10-7	700	160	0.3	C	201	97.6
C/8	700	OPEN	OPEN	C	19,256	*
C/9	700	OPEN	OPEN	C	7273	12.4
10-8	700	250	0.3	C	548	93.4
10/9	700	200	0.2	C	418	95.0
10-10	700	180	0.032	C	582	93.0

* = SO_2 concentration of effluent exceeds that of feed indicating adsorbed SO_2 is desorbing from the catalyst during the experiment

A = 9300 ppm SO_2 in He
B = 9200 ppm SO_2, 2700 ppm O_2 in N_2
C = 8300 ppm SO_2, 21,000 ppm O_2 in N_2

Experiments 10-1 through 10-4 show that zinc ferrite is an effective electrocatalyst for the reduction of SO_2, and that increasing driving force (applied potential) increases the removal rate. Experiment 10-1 also shows that no potential is needed to reduce SO_2.

Experiments 10-5 and 10-6 and Comparative Experiment C/7 show that in the presence of oxygen zinc ferrite is still an effective SO_2 reduction electrocatalyst and that under the open circuit conditions of Comparative Experiment C/7, where no oxygen transport occurs, SO_2 is not removed. In fact, previously adsorbed SO_2 begins to desorb.

Experiment 10-7 shows that higher concentrations of oxygen do not adversely affect the SO_2 reduction process, and Comparative Experiment C/8 shows that when the circuit is opened to stop oxygen transport, the SO_2 reduction ceases and SO_2 desorption begins. Comparative Experiment C/9 is conducted about 24 hours after Comparative Experiment C/8